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ABSTRACT

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RESEARCH REPORT 7

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ABSTRACT

In cooperative learning environments, small groups of students work together to accomplish specific pedagogical tasks, and teachers act as facilitators. One highly significant characteristic of cooperative learning that has received little consideration so far is the shift in participation frame that takes place when students are left alone to work on classroom tasks rather than having the teacher direct the learning process. In cooperative learning processes, students are free to take their own time to work out their learning strategies, and they rely on peer group processes of the kind associated with home and play environments, both to establish collaboration and to guide their own learning. It is in such exchanges that learning processes can be made into observable activities.

Central to the case studies described in this report is the fact that everyday informal conversational exchanges play an essential role in group processes, where one speaker is given primary rights of speaking, but where participants must compete for the floor and cooperate in achieving shared communicative tasks. The cases presented here are drawn from the Cooperative Integrated Reading and Composition (CIRC) database, which includes approximately 200 hours of 90-minute video recordings collected through ethnographic field work in third and fourth grade bilingual classrooms over a period of 3 years. We concentrate on in-depth conversational and interactional sociolinguistic analysis of selected excerpts that illustrate key learning and teaching issues that arise in cooperative learning situations in monolingual and bilingual classrooms.

INTRODUCTION

It is by now well established that self-organized acts of learning can have important long-term cognitive benefits. The many programs of cooperative learning, while they vary in detail, all agree that participants must actively work together for such benefits to be realized (Cohen, 1990). Further, because cognitive change is revealed through the ways in which learners' sense of ownership and control over their intellectual products is increased over time, the changes are not easily observed as they happen. Students generally work in small, informally organized groups, relying on their own everyday communicative practices. Instances of ongoing productive collaboration often seem fleeting or hard to detect. Apart from relying on such finished products as workbooks or written texts, teachers—who spend much of their time circulating in the classroom and answering questions as they come up—may have difficulty determining whether student groups are making progress. One of the teachers in our research group commented that watching the analyzed videotapes of groups at work enabled her to gain useful insights into how the children go about solving their tasks and how easily adults' questioning can influence students' attempts to integrate what they are learning with what they already know.

Our research on collaborative learning has been guided by questions such as the following: If we are looking for evidence of individual achievement in order to evaluate program success, how can we know we are looking at the right phenomena? Can we rely on evaluations that relate performance on standardized tests to incentive and reward structures? The validity of such measures has been seriously debated for several years (Durán, 1989; Gardner, 1990). Should we instead, as a means of gaining more direct insights into the potential benefits of cooperative learning, examine more closely how collaboration reveals itself in the classroom and analyze what children do in working together and how teachers meet the challenge of entering into informal interactions with student groups? That is the course we intend to take here.

We use the term *collaboration* to mean collaborative interaction in situations where two or more individuals are demonstrably working together toward the achievement of particular tasks. Recent work on organizational design and small group functioning with adults tells us that collaboration in work settings is regarded as difficult to achieve; it does not just happen when people are put together and required to do a task in unison (Galagher, Kraut, & Egido, 1990). A supportive social milieu and a task infrastructure are required. In this paper, we focus on collaboration as a group phenomenon in which complex tasks are managed through close, step-by-step, apparently casual monitoring by participants of each other's actions, often cued through language. It can be argued that with children, the need to provide support and task infrastructure is even greater than with adults (Tharp & Gallimore, 1988).

The advantages of student-guided learning are described in the recent literature on mathematics instruction, where cooperative programs have come to take an important place among the innovative methods designed to improve performance. They do this by creating a learning environment where students are able to make sense of new information by relating it to what they already know. Consider the following statement from a report by the National Council of Teachers of Mathematics:

> **All students engage in a great deal of invention as they learn mathematics; they impose their own interpretation on what is presented, to create a theory that makes sense to them. Students do not learn simply a subset of what they have been shown. Instead, they use new information to modify their prior beliefs. As a consequence, each student's knowledge of mathematics is uniquely personal. (1991, p. 2)**

Brown and Campione (1993) have developed methods of instruction through guided discovery and participation that address some of these issues directly. Their classroom procedures are designed to provide a complex organization of several types of participation frames (Goodwin, 1990). They conceive of instruction as sequences of first small, then larger participatory groups, until the whole class is involved in what is called a "community of learners." Brown and Campione state that "the essence of teamwork is pooling expertise," and they point out that in their classrooms, "we also aim at increasing diversity of expertise and interests so that members of the community can benefit from the increasing richness of knowledge available to them" (1993, p.8). They describe their methods of achieving instructional change as the creation of "subcultures of expertise," where students can do their own work but where they can share their findings in many ways, from addressing a small group to presenting in front of a whole classroom community. Although the person in the role of expert varies, sequences of presentation, discussion, and deliberation remain central to the activities. Whole class and group discussion sequences are built on a dialogic structure that usually follows a modified Socratic method, where one student is placed in the role of expert, and there is a main speaker and multiple listeners, as well as a single responder within a question-answer format (Brown & Campione, 1993; Brown & Palinscar, 1989). The authors go on to point out that the difficult art of teaching in such classrooms requires the teacher to judge the situations and times at which adult intervention would provide guidance and not interference. They stress that in order to bring cooperation to the traditional classroom, it is necessary to adjust the balance between teacher-led discussion and group work, so that children can exchange information for themselves.

However, the Brown and Campione science education project has each group choose a single expert who directs the proceedings and so sets up a dominantly one-to-many participation frame. Moreover, much science instruction, like mathematics instruction, relies in part on certain instructional tools, such as numerical representations or geometrical models or laboratory equipment, to assist in conveying information. Students tend to work on problems where the cognitive operations are closely related to pre-established procedures or algorithms, so that the domain of expertise can more readily be delineated. Language arts programs, on the other hand, although able to emphasize different kinds of language genres, such as poems, story telling and writing, plays, play acting, and —for young children—the use of drawing to support writing, ultimately depend on words as the main tools for learning. Both instruction and evaluation of performance rely almost exclusively on talk, so that potentially everyone is an expert. For this reason, it becomes necessary to seek systematic information on how language or talk functions in such programs in actual classroom situations: that is, information about the communicative activities through which teachers teach a subject's content and through which students manage their own learning in order to understand how performance outcomes are achieved.

In cooperative learning environments, small groups of students work together to accomplish specific pedagogical tasks, and teachers act as facilitators (Slavin, 1990). Many of these classrooms rely on relatively informal communicative strategies that are conversational in form but instructional in intent, as teachers scaffold the learning process by restating and expanding on students' contributions (Tharp & Gallimore, 1988). Frequently made arguments in favor of these new informal methods are that they have much in common with the parent-child and peer-group interaction processes that researchers have found to be so important for children's learning and cognitive development (Rogoff, 1990).

One highly significant characteristic of cooperative learning that has received little consideration so far is the shift in participation frame that takes place when students

are left alone to work on classroom tasks. In many traditional classrooms, the teacher directs the learning process, guiding the students through the various stages of a task by questioning and evaluating contributions at every stage in the process. Students' participation is usually confined to relatively brief replies that are expected to be responsive to the teacher and that are subject to close monitoring and evaluation by the teacher for their possible relevance (Mehan, 1979). In cooperative learning processes on the other hand, students are free to take their own time to work out their learning strategies, and they rely on peer group processes of the kind associated with home and play environments, both to establish collaboration and to guide their own learning. Support for cooperative learning processes comes from educational psychologists and anthropologists who, following Vygotsky's theories, see learning as an interactive process based in communities of practice in which groups of individuals collaborate in the pursuit of shared goals (Moll, 1992; Wertsch, 1985). It is in such exchanges that learning processes can be made into observable activities. Central to the case studies described here is the fact that everyday informal conversational exchanges play an essential role in group processes where one speaker is given primary rights of speaking, but where participants must compete for the floor and cooperate in achieving shared communicative tasks.

CASE STUDIES

The cases presented here are drawn from the Cooperative Integrated Reading and Composition (CIRC)[1] database, which includes approximately 200 hours of 90-minute video recordings collected through ethnographic field work in third and fourth grade bilingual classrooms over a period of 3 years. We concentrate on in-depth conversational and interactional sociolinguistic analysis of selected excerpts that illustrate key learning and teaching issues that arise in cooperative learning situations in monolingual and bilingual classrooms.

Our analyses make visible some of the inherent complexities of cooperative learning for both monolingual and bilingual students. In the CIRC reading and writing curriculum, students go through a cyclical sequence of activities: vocabulary review, followed by story reading and retelling, followed by the formulation of informal oral solutions, then by more formal written answers to a series of questions designed to test reading comprehension. The students must draw inferences based on the text, reflect on what they know about what they have read, and learn to distinguish between their own personal knowledge or conclusions and knowledge derived from texts. In carrying out these tasks, they rely on discussion to work out their informal response, construct their written answers, and manage their group so that individual participants cooperate (Durán & Szymanski, 1995).

The basic assumption underlying our analysis is that participating in conversation requires more than just lexical and grammatical knowledge. Speakers assume that their listeners share background knowledge that allows them to go beyond literal meanings in order to infer what is intended in the situation at hand. This inferential process rests on meta-communicative processes that build both on non-verbal body language and on linguistic signs or contextualization cues (Cook-Gumperz,1986; Gumperz, 1981, 1995). Such cues serve to retrieve the contextual presuppositions in terms of which specific interpretations are made. While grammatical knowledge is generally shared by all speakers of a language, meta-communicative background knowledge and the cues by which it is evoked are acquired in large part through shared experience. Where this experience differs—as, for example, with adults and children or with people of different communicative or cultural backgrounds—what looks like the same message may be subject to different interpretations (Gumperz, 1981). Our analysis seeks to uncover systematic interpretive difficulties that tend to go unnoticed

by those immersed in an interaction to determine to what extent these are based in meta-communicative signs and to show how they may affect the teaching and learning process.

Before turning to self-organized student learning groups, we present two excerpts from teacher-led lessons to illustrate the difference between students' and teachers' discursive practices and to reveal the often unforeseen linguistic problems that arise when children's informal oral responses must be translated into more formal expository prose. The teacher in Excerpt 1 concentrates on the first part of the answer-formulating process—incorporating the question content into the answers.

Excerpt 1. Why Do You Think[2]

S S2
S3 S4

1	T:	why do you think [Peter] is getting angry,
2	S3	[why]
3	T:	how's that answer gon[na start,?]
4	S2:	[do you]
5	S:	because
6	S2:	do YOU think Peter is angry, [yes he]'s angry
7	T:	[why,]
8	T:	why do you think-
9	S:	because the wish [bo-]
10	T:	[wait] a minute,
11		when I say WHY do you think,
12		what is your answer going to be,?
13	S2:	why do you think Peter's angry
14		cuz all the an- animals are doing,
15		[like making noise]
16	T:	[wait a minute,wait] a minute.
17		why do you think
18		..
19		what [is your answer going to be,?]
20	S4:	[because we are t(h)inking]
21	T:	start the answer, just start the answer.
22	S	I know.
23	T:	why do you think
24:	S4:	((raises his hand)) oh, I know, because i-
25		[be]cause
26	T:	[no]
27	S:	I think
28	T:	ah, you hear how he started the answer?

The teacher (T) begins by reading out the question, then in line 3 she gives more specifics about what is wanted. The students' task here is to identify the opening portion of the question and transform it into something like: "I think Peter is getting angry because . . ." so that the responders become the principal actors. But this goes counter to what they are used to doing in every day talk, and they have problems seeing what is wanted. In turns 2 and 4, the answerers simply echo the teacher's words, as if perhaps they are trying to gain time. In turn 6, S2 comes up with his own syntactically complete candidate opener, which, although inappropriate, at least suggests that he understands he must not use his accustomed informal opener. But T reacts by merely repeating the first part of the original question, "why do you think," as

if to hint that this is what he must work on. When in line 9, S seems about to begin with an informal opener, T reacts by elaborating on her previous response. For the rest of the exchange, she continues to reject students' contributions, frequently interrupting before they can complete what they are going to say and repeating her reiteration strategy, each time with more insistence. Finally, S begins with "I think" in line 27, which T then confirms, commenting "ah, you hear how he started the answer?" The students now have a model to follow and the work goes on more productively.

If we compare the students' responses above to how they work out answers in self-organized groups (see Excerpts 3 and 4), we see that at first, students frequently start with incomplete or ungrammatical expressions. These are then gradually built on over several turns at speaking until the correct answer is found. In teacher-led groups this does not happen. It is also possible that students' difficulties are due in part to the differences between English—which relies on pronouns to mark the shift in perspective that the answer format requires—and their native Spanish, where verbs are inflected for person by means of a verb suffix, while personal pronouns mark special emphasis. We will deal with such issues later in this paper.

In Excerpt 2, the teacher provides a systematic procedure for constructing both the first part of the answer and the second, content part. While the teacher in Excerpt 1 relies on students to figure out by trial and error what she wants them to do, the teacher in Excerpt 2 makes every attempt to be lexically explicit about what the task involves. In line 6 below, for example, she employs a meta-communicative comment—"the lived part is the most important part of the question"—to show her students how to identify what is at issue in the question and thereby to learn how to format answers.

Excerpt 2. What The Question Wants To Know

1	T:	okay, *so. .. (again), what are we a- being *asked in this
2		first question? what does the question wanna *know?
3		(0.5 pause)
4	S:	where did the little mice live.
	X:	
5	T:	'kay, **where the mice *lived. *so, **where the mice ~lived,
6		the *lived part is the most important part of the question, isn't it,
7		(0.5 pause)
8	S:	lived, xxx
	X:	
9	T:	'kay, so if we were gonna form, an *answer, before we
10		even tell *where they *lived, we have to ~say,
11	S:	*they lived,
	X:	
12	T:	okay. .. *they lived or the ((writing on board)) **mice .. ~lived, .. okay,
13		so that's our first part of the question!
14		we know now what we're being- wha- what our *answer is,
15		.. and where *did they live?
16	S:	in=::=
	X:	
17	T:	=the= *mice lived *where. (1.0) =Peter,="
18	P:	=( )= (wall.)
19	T:	okay I want *more information than just *wall,
20		because maybe, they lived, in- in that wall over there?
21		but —>they- in the story they were more specific,
22		they gave more information than just a wall.
23		um, Albert.

24 A: uh, it's *stone!
25 T: okay,
26 A: it's a stone *house.
27 T: in a *sto::ne, .. =what.=

Note how this teacher deals with the answer opening problem. Having identified the main part of the question, she goes on as follows in lines 9 and 10: "before we even tell where they lived, we have to say," whereupon she pauses slightly, providing time for S to attempt to complete her sentence. The latter then comes in with, "they lived." At this point, T turns to the board and repeats "they lived"; then, starting to write on the board, she corrects herself, saying "or the mice .. lived," "okay, so that's our first part of the question."

In the next part of the exchange, T concentrates on a second issue, the need to make the answers lexically specific enough that the listeners can locate what is intended based on the answer alone, without having to call on outside knowledge. She turns back to the group to ask, "the mice lived where." When no one volunteers, she calls on Peter, who volunteers, "wall." T, pointing out that this is not a sufficient answer and that the story provides more information, calls on Albert. At first Albert replies, "it's stone"; then, when T confirms, he goes on to amplify, "It's a stone house." In response, T adds the new phrase to the original answer that she had put on the blackboard earlier: the mice lived "in a stone . . . ." leaving the last word for the students to fill in.

The teachers in these two excerpts employ different instructional strategies, with the latter relying on a more conversational approach akin to what Goldenberg calls instructional conversations (Goldenberg, 1993). But in both situations, it is the adult who controls the proceedings. In the following excerpt we will see that the students, when left on their own without the teacher's direct guidance, use quite different discursive means to achieve similar ends.

Voicing

A key strategy that students employ in their self-guided problem solving is *voicing*. That is, they signal changes in perspective by means of contextualization cues such as intonation, stress, and volume, in order to manage their interactions and to indicate message function. Children frequently use voicing to convey their communicative intent in informal interactions. Adults, who like the teacher in the preceding excerpt are more likely to use lexical means, may not be aware of the implications of what the children are doing (Gumperz & Field, 1995; Gumperz & Herasimchuk, 1975). The children's communicative strategies depend on sociolinguistic and interactional resources of the kind we illustrate in the excerpts below. They rely on shared experiences to create the common ground for inferring what is intended. Collaboration thus depends on having peers with similar communicative and cultural backgrounds and with the ability to utilize these experiences in interpreting what is said.

In Excerpt 3, three fourth graders are sitting around a table alternately reading and writing and at times just talking informally. They are working on comprehension questions for the story, *Different Shape* (Greenfield, 1978). The procedures they have been taught to follow involve several distinct steps, not always occurring in the same order: deciding what the question is about, or as one of the teachers puts it, "what the question wants to know"; deciding what information should go into the answer or what the idea of the answer is; and constructing the written answer. In this last step, the students can be seen essentially translating what they have to say into the school's expository prose genre.

In constructing the answer, students are explicitly trained to—as the teacher says—"put the question in the answer": in other words, to use the question to frame the information provided in the answer. For example, the answer to the question in Excerpt 4— "What surprising discovery does Molly make?"—would be framed by rephrasing the question as follows: "The surprising discovery that Molly makes is . . . ." This often becomes a complex grammatical task that involves considerably more than just reiterating information and gives rise to much explanation on the part of the teachers and negotiation on the part of the students.

But before turning to these issues, let us begin with a turn-by-turn examination of the verbal activities that make up a student exchange.

Excerpt 3. Found Out

S S2
S3

1	S2:	((flat , continuing intonation)) Why- how did Genny
2		react to her Dad's news.
3	S:	over on .. uh .. Warren Street.
4	S3:	.. when- ((staccato annunciation, increased volume))
5		when Genny found out that this *happened,
6		... (10.0)
7	S3:	((pianissimo)) found?
8		... (3.0)
9	S3:	((pianissimo)) found?
10	S2:	((pianissimo)) Genny found?
11	S3:	when Genny::,
12	S:	... what did Genny-
13	S3:	... yeah. ((increased volume)) when Genny **hea::rd.
14	S2:	found- - found out.
15	S3:	yeah. ((pianissimo)) when Genny found out,
16		...(10.0)
17		... about.
18	S:	... ((louder)) how did- he- she- how did- Genny *react?
19	S3:	((increased volume, marcato tempo))
20		when Genny found out, .. about this, ... she,
21		.. didn't, (2.0) ((accelerated tempo, decreased volume))
22		want to live with these people anymore.

At issue here is the meaning of "found out." As the transcript begins, S2, who for the moment is working by herself, is reading aloud the question to be answered as if to ask the others to collaborate. S follows with the semantically unrelated, "over on Warren Street." But since she is not looking at S2 and her rhythm is perceptively different from S2's, it seems that she is involved in her own task and not yet collaborating in the exchange.

In lines 4 and 5, S3 responds to S2's reading by proposing the first part of the answer. She speaks with raised volume and relatively slow tempo and staccato voice. All three participants now start writing. After a pause of about 10 seconds, S3, in line 7, follows by repeating "found," but this time with question intonation, as if to query what she has just said. There is no reaction, and 3 seconds later she repeats her remark. S2 then echoes S3 with her own query, "Genny found?" in line 10. This indicates that S2 and S3 are now collaborating. In line 11, S3 resumes her earlier staccato delivery. Evidently she is getting ready to make an attempt at the answer. S, who seems to have noticed

that S3 and S2 are collaborating, begins to repeat the original question in line 12 as if to say, "I am starting to work on this question now," but S3 and S2 continue their own course of action. S3 then turns to conversational style in line 13, first with "yeah," as if to say to herself and to the others, "I've got it," then with raised volume goes on: "when Genny heard." The "heard" is marked by strong accent as if to suggest, "'found out' is equivalent to 'heard.'" S2 then comes in with "found - - found out," this time with a falling intonation contour, which echoes that of the preceding "heard," as if to say, "yeah, found out is equivalent to heard." S3 accepts her confirmation by repeating her initial formulation, "when Genny found out," in line 15. There is another longer pause, after which S3 comes out with "about," continuing with the same intonation and rhythm, as if she were sounding out her own thought processes. In line 18, S raises another question, about the term "react" in the original wording of the question. Apparently she is now ready to collaborate on the task, but S3 continues producing her own complete answer.

S3 and S2 have clearly collaborated in working out the answer to the question. But in doing so, they rely largely on the sequential ordering of their talk and on prosodic and other paralinguistic signs such as intonation, volume, and rhythm to guide the negotiation process. It is important to note that this voicing has no meaning in isolation apart from the overall discursive context. Communication is achieved through the sequential positioning of prosodically marked strings of talk to establish what we will call discursive oppositions. That is, the students are indirectly conveying meaning by using talk to set up a contrast between two expressions. This signaling strategy is inherently interactive and often involves more than one speaker. For example, when S3 repeats the verb "found" in the prior phrase using questioning intonation, she is suggesting that the prior action is being singled out for what conversation analysts have called repair, and that it is in some way being questioned. By contrast, when S3 repeats S2's "found out," echoing her intonation contour, the repetition counts as a confirmation. To be sure, such communicative strategies are not confined to children; adults also use them, but ordinarily only in relatively informal settings.

The distinction between conversational mode and the answer voice is not only a matter of prosody but of syntax. The students' use of voicing here shows their gradual realization of a syntactic problem in formulating their answer. Informal English typically relies on two-part verbs like *get up* or *come in* to indicate directionality of an action, whereas Spanish relies on different verb roots to convey similar information: for example, *arise*, *enter*, and—in the case of *find out*—*discover*. By using voicing to work out their answer, the students are becoming alerted to the significance of such a difference. Numerous instances of voicing are found throughout our corpus as well as in earlier classroom data (Gumperz & Herasimchuk, 1975). In the following example, we will see another instance of syntactic difference worked out in a collaborative process in which voicing similarly serves to aid the negotiation process.

In what follows we will examine similar issues in more detail, this time with a Spanish-English bilingual third grade group recorded a year later in a different classroom. The students have recently made the transition from reading and writing in Spanish to reading and writing in English in the CIRC curriculum. The four students in the group are seated around a table. Two of them are engaged in paired reading and do not enter into this particular exchange. The excerpt begins with S in lines 2 and 4, then in line 3, S3 joins him in reading out a question from the text: "What surprising discovery does Molly make?" In the story, *Molly and the Slow Teeth* (Ross, 1980), Molly, who has long been waiting for her tooth to fall out, suddenly discovers that her tooth is loose.

Excerpt 4a. Surprising Discovery

S S2
S3 S4

1		(2.0)
2	S:	{R>} what- wha-
3	S3:	{R>} THAT, WHAT sur-[prise discovery does molly make,]
	:	
4	S:	{R>} [prise discovery does molly make,]
5		(0.7)
6	S:	discovery n does molly [make,
7	S3:	[molly make,
	:	
8		(·)
9	S:	no, molly: make?
10	S3:	no:,
	:	
11	S:	discovery does,
12	S3:	NO.
	:	
13	S:	oh so-, oh discovery surprise (·) molly make,
14	S3:	discovery surprise (·) molly make?
	:	
15	S:	oh 'pérate, (·) su-pri-, discovery: [(does)
		wait [
16	D:	[we'll get back to that one,

The pause in line 5 suggests that the students seem to be having difficulty creating a frame for the written answer. They go about their task by a piecemeal process of guessing, as if they were constructing a jigsaw puzzle, picking out individual pieces of the question and trying them out for size to see how they can be used to build an acceptable answer frame. When after several tries they do not seem to be making any progress, S3 suggests in line 16 that they give up for a while and continue on with another question.

Four and a half minutes later, after working on two other questions, they take up the problematic question (number 2) once again. S uses the informal bilingual peer group style, in which Spanish and English may alternate as part of the same message.

Excerpt 4b. Surprising Discovery

17		(2.0)
18	S:	qué es number two,
		what is number two,
19		(0.4)
20	S3:	I don't know yet, (you,?)
	:	
21		(0.1)
22	S:	I'm surprise,
23	S3:	{R>} what surprise dis-covery does Molly make, {<R}
24		Molly make:, no
25	S:	Molly MAKES
26	S3:	Molly MAKES?
	:	

27 S: a discover
28 S3: a discovery? a discovery,
29 : surprising?
30 S: no, Molly makes ah:
31 S3: a discovery,
:
32 S: a surPRISing discovery duh:,

In contrast to what happened in 4a, the students are now beginning to gradually piece together the answer frame by successively building on each other's responses. In line 22, S comes out humorously with an initial answer frame, "I'm surprise." S3 repairs this in line 23 by reading out the entire question once more; then she follows up with her own contribution in line 24, "Molly make," which she herself rejects. But now that the phrase is available, S builds on it with his repair in line 25, "Molly makes." When S3 queries this, S follows up in line 27 by proposing "a discover" which, although ungrammatical, nevertheless projects a complete clause. S3 then utilizes S's guess to continue building the frame in lines 28 and 29. She begins with a strategy similar to the one we saw in Excerpt 3 of weighing or assessing each candidate element separately. First she questioningly picks out "discovery" and immediately afterward confirms it. Then, once more in a questioning tone, she highlights "surprising," as if to ask herself, "how do they fit together?" In line 32, S proposes a possible solution to S3's problem. He emphasizes "surprising," as if to say that is the solution, and he ends his turn with 'duh," the frequently used peer group expression that here seems to mean, "it was easy dummy!"—as if to claim he knew the answer all along.

Several turns later, in Excerpt 4c, line 46, S3 brings up the question again, but note that the grammatical problem surrounding "surprising discovery" now seems to have been resolved, and the negotiation centers on what to include in the written answer.

Excerpt 4c. Surprising Discovery

46 S3: {R>} what (.) surprise discovery does Molly MAKE. {<R}
47 : (0.2) let me see:
48 S: oh, what surprising discovery,
49 th- you have to WAIT.
50 (2.0)
51 S3: no:: , ((to self))
:
52 S: PATIENCE.
53
54 S3: OKAY:,
55 : (one ,) ((points to paper)) (.) Molly makes (.) a discovery.
56 S: SURPRISING (.) discovery,
57 OKAY s- discovery Molly makes,
58 S3: a surprising discovery?
:
59 (0.4) ((S puts head on desk))
60 S: DISCOVERY::!
61 S3: Molly makes (.) a surprising discovery,
:
62 S: Molly makes-
63 S3: Molly: [ma:kes ((underlines))
:
64 S: [a:: discovery, que era surprising discovery
that was

65 S3: a surprising discovery ((underlines))
:
66 S: eso? s: surprising,?
that
67 S3: yeah, surprising discovery. ((underlines))
:

Apparently, S3 was not yet convinced of the adequacy of S's proposed answer frame where "surprising" is used as an adjective. S3 and S go back and forth in lines 56-63, continuing to employ prosody-based negotiating strategies, until S comes up with the paraphrase, "discovery, que era (that is a) surprising discovery," in line 64. S3 then repeats the clause with falling intonation by way of confirmation and underlines this part of the question on her paper. In line 66, S, who sees what she is doing, questions her as if to say, "Is this really it," whereupon S3 confirms both orally and by continuing to underline. His codeswitching strategy has proved to be successful.

To sum up, the students begin as they have been taught to do with an examination of the question. Problems arise with the phrase, "surprising discovery." These are then explored and negotiated in much the same way that the meaning of "found out" is negotiated in Excerpt 3. A rephrasing of "surprising discovery" as a "discovery que era [that was] surprising" does roughly the same work as the choice of "heard" as a paraphrase for "found out." By means of these paraphrases, children relate what they are learning to what they already know and thus work out the meanings of problematic expressions that themselves have a wider syntactic importance.

Excerpts 3 and 4 illustrate the students' use of interactive strategies to determine a) what is at issue in a question, b) what is wanted by way of an answer idea, and c) how the answer is to be formulated. In both cases, the question is first read out. The process of constructing the answer begins with tentative formulations of the answer frame, which are then discussed, questioned, modified, and agreed upon. In the course of this process, issues of comprehension and grammatical problems are resolved. The cognitive processes that go into the answer construction are revealed in the manner in which the negotiation is conducted.

An outside observer who expects strategies akin to those employed by the teacher in Excerpt 2 might argue that the children are being repetitive and not getting anywhere. Yet when left alone to develop their own solutions, the students are in a way acting like linguists. They deal with questions of contrastive lexical semantics and syntax and examine possible solutions, but without using overt categories to indicate what lexical and grammatical relationships are involved. Note, moreover, that since their problem solving is embedded in their ongoing interactions, they are focusing on how grammatical and semantic rules are used in context and not just on abstract categories.

One might ask: How systematic is the students' use of voicing? The best way to answer this question is to show what happens when expectations based on voicing are violated. In the following passage from another portion of the videotape examined in Excerpt 3, S3 is taking her turn reading a passage in the story to the group. This passage is particularly dramatic, as it deals with a young girl's coming to terms with her parents' impending divorce (Greenfield, 1978). S3 intersperses her reading with comments on her own feelings about the story's content, but when the prosody of her comments spills over into her reading activity, the others object.

Excerpt 5a. How Sad

S S2
S3

1	S3:	.. Oh:, .. how sad, .. {R>} the little girl, .. she didn't under-
2		.. stand. .. ((breath)) .. she- .. she thought it was her fault {<R}
3		.. ((pianissimo)) oh: God I've got to read this whole-
4		(0.3 pause) wait-
5		.. ((louder volume)) {R>} and then her father was
6		... up too, ... hugging her with tears in his eyes. {<R}
7		((lo pitch, rhythm shift; slower tempo)) {R>} no,.. baby, .. no, .. he said.
8		..it's not your fault. ... it's *me, and your momma. .. it's *our fault. [but
9		Ki-] {<R}
10	S:	[you don't] need to read it like that.

The transcript shows S3 to be alternating between reading and commenting on the story. She starts with a comment, "oh how sad," then shifts to reading voice. Later, when the story quotes the father's words, S3 gives a rather highly contoured rendering in lines 7-9 which causes S to object in line 10. A few turns later, S falls back into her emotionally charged reading.

Excerpt 5b. How Sad

14	S3:	((S3 continues reading in flatter intonation)) {R>} but Kim was, .. but
15		Kim was saying over and over, ... into his chest, ((quotationvoice; high
16		pitch, slower rhythm, tearful intonation)) ... don't leave us, .. Daddy, ..
17		please don't leave us. ((flatter reading voice intonation)) ..Genny turned
18		to her mom, to her mother, ... still trying to understand, .. but Larry fixed
19		everything last night, .. she said, .. Genny, {<R}
20		
21	S:	.. ((marcato tempo)) I can't understand you when you're
22		reading like this. ((laughing)) I understand-
23	S3:	okay.
24	S:	I ~understood, what you *said, but-

Responding to S's objection, S3 in lines 14-20 returns to her earlier, more controlled reading voice, but then when the text gives another quote, she once more reverts to highly contoured intonation. What this passage suggests is that for the children, the use of voicing to mark the contrast between reading and commenting has normative force. It would seem that voicing for them constitutes the activity.

Negotiating Answers

Also of interest are the learning practices involved when the children deal with grammatical or comprehension issues. Ervin-Tripp (1986) has pointed out in an earlier study that in their second language learning activities, children often create game environments to get the learning task done. Our classroom data reveal similar phenomena. The interactional space provided by the cooperative learning peer group allows the children to deal with grammatical and comprehension issues through a game-like process that we refer to as serial guessing. In this process, students may freely discuss their concerns by sequentially proposing differing hypotheses without having to engage in formal answer construction. In what follows, we take up this issue once more to illustrate the students' collaborative problem-solving strategies.

We begin by reconsidering the sequentially organized strategies by which the students in Excerpt 2 settle their comprehension problems with the verb phrase "found out."

Excerpt 2. Found Out

9	S3:	((pianissimo)) found?
10	S2	((pianissimo)) Genny found?
11	S3:	when Genny,
12	S:	... what did Genny-
13	S3:	... yeah, ((increased volume)) when Genny **hea::rd.
14	S2:	found- — found out.
15	S3:	yeah. ((pianissimo)) when Genny found out,
16		... (10.0)
17		... about.

Note how in line 10, S2 echoes S3's move to indicate that they are both concentrating on the same issue. But now consider the various steps through which the children arrive at a solution. In line 11, S3 begins formulating the opener. S, who just before had been working on a different problem and who now is attempting to join in, speaking in a different "thinking out loud" rhythm, is ignored. Instead, S3 says "yeah," as if answering her own question, then continues constructing the answer using prosody to foreground "heard." From the way S2 reacts to S3's move, we can infer that she is suggesting that (a) "found," as used in the original question, is semantically equivalent to "found out," and that (b) both are similar in meaning to "heard," a term they know. The negotiation proceeds via sequentially organized and prosodically marked guesses or hypotheses such that one hypothesis cues off another until finally a consensus is reached on a particular solution. Such sequences are found throughout the data.

In the passage below, similar means are employed to accomplish the task of writing a meaningful sentence that will define the word *tongue*.

Excerpt 8. Tongue

S2	
S	S3
S5	S4

1	S2:	I DON'T KNOW ANYTHING FOR TON:GUE:.
2	S:	everybody has a=
3	S3:	=I have a tongue to chew with, yeahahahah ((to S2))
4	S4:	(yeah,(.) like [this] ((pretends to chew with tongue))
5	S5:	[I sheesh]
6		(0.2)
7	S4:	I got a
8	S2:	I have a [tongue to lick.
9	S5:	[tongue twister.
10	S3:	( )
11	?:	tongue?
12	S2:	I HAVE A TONGUE (.) to lick.
13	S:	yeah yeah [yeah.
14	S3:	[to lick what:,?
15	S2:	to lick sno[wballs
16	S:	[slurpees slurpees slurpees]
17	S5:	[THI::NGS, TO LICK]
18		[THI::NGS.

19 S2: [WE HAVE TO LICK SLURPEES.
20 S: yeah slurpees.

In line 2, S begins with a frame for a sentence that, while incorporating the word tongue, is not likely to lead to a meaningful definition of the word. His suggestion evokes a humorous reply on the part of S3, followed by laughter. Finally in line 8, S2 picks up S3's frame to produce a sligh tly more appropriate answer, since tongues are for licking rather than chewing. This is then gradually developed by means of a series of guesses into a sentence that is accepted by the group. In a way, the process has some similarity to a game of darts, where the players in their successive tries gradually come closer to the bull's-eye.

Bilingual Practice

As was pointed out above, students engaged in collaborative problem solving often shift from reading to conversational voice, then, in a special declarative "The answer is . . ." voice, sound out their solutions as they are writing them down. Such shifts in mode, which are common to discourse everywhere, convey meaning in the sense that they contribute to interpretations of what is intended at any one time and suggest appropriate counter moves on the part of listeners. Among other things, they indicate speakers' position vis à vis the message, distinguishing, for example, between tentative suggestion and definite proposals. In what follows, we will argue that codeswitching (between Spanish and English in this case) achieves a similar communicative end. The point to be made here is that bilingual knowledge can be used for persuasive effects in ways that resemble the uses of voicing illustrated above.

In the excerpt below, Spanish serves to scaffold S's attempts to spell the word little.

Excerpt 6. Spell Little[3]

S S2
S3 S4

1 S: come on:, he:lp me:, (only) (·) how to spell lidle,
2 (0.2)
3 S2: liTtle?
4 S: »yeah«
5 S2: AH HA [HA HA HA::]
6 S: [tampoco tú lo sabes]
you don't know it either
7 S3: L
8 S2: nuh huh,
9 S3: it starts with an L,
10 S2: I know,
11 S: una L, (no más hay que) decir eso.
12 *an you only had to say that*
13 S2: hmmm
14 S: ((looks up at S2)) y QUÉ (.) y luego qué,
15 *and what and then what*
16 (1.0)
17 S2: L .. l:
18 (.)
19 S: l?
20 S2: °T

21	S:	I as in ah
		A
22	S2:	I: la e:: [e::] e::
		the I I I
23	S:	[duh]
24	S:	oh, chiquita, verda'?
		very-small true
		very small isn't it [i.e. lower case]
25	S2:	E: no, la e:, ((write in air))
		the I
26		»con la e,« T T
		with the I

The excerpt shows a number of instanc*es of* codeswitching (Gumperz, 1981; Heller, 1986), defined here as the alternate use of two languages in the same interaction. If we look at the exchange in detail, the choice of language is by no means random. It directly relates to the interactive work the students are doing. Having just asked S2 to help him, S first uses Spanish in line 6 in reacting to S2's derisive laughter. By accusing her of not knowing the spelling, S is in effect challenging her to help him. At this point, a third party, S3, tries to join in. This sets off a brief exchange with S2, which ends in line 11 when S, looking at S2, switches to Spanish saying, "an L, you only had to say that." S3 drops out, and S2 begins to coach S in the spelling task.

In the remaining part of the exchange, S is using his Spanish as a resource for integrating what he knows about the activity of spelling into the task of writing the English word. This becomes problematic, because S2 is spelling in English. In trying to understand what is happening, S questions her in line 19 concerning the vowel "i," using the intonation-based querying strategy we saw in the earlier excerpts. When S2 continues spelling out letters without responding, S expands his question in line 21 into a complete English phrase that reveals his own hypothesis of what the sound-letter relationship is. S2 catches on to S's mode of reasoning and provides him with the correct English-Spanish vowel equivalents in line 22. The interaction concludes when S again uses Spanish to clarify his understanding of the vowel in line 24, and S reiterates the spelling, also in Spanish, to indicate agreement.

It would seem that Spanish is the basis for the interaction from line 11 on. Participants choose Spanish to express what they actually think and to accomplish the task of spelling in English. If learning is integrating new information into the already known, this exchange is evidence that these students are actually engaged in learning. Furthermore, as we have suggested above, the codeswitching between English and Spanish in this excerpt does much the same work as the shift from conversational style to answer talk in the monolingual classroom.

In the next excerpt, the situation is somewhat more complex. Four students, who have recently made the transition from Spanish to English, are about to begin working on the question, "What advice does Mervin give Molly?" S, who has just finished the preceding question, is talking to a student at the next table. S4 and S2 are talking to the student aide (T on the transcript), while S3 is working on answering questions to a story and is trying to get the others to collaborate. While most of the talk is in English, classroom rules permit the use of Spanish. As in the previous excerpt, there are a number of instances of codeswitching. In addition to having to construct an answer, the group is having problems coming together to cooperate on the same task. Our analysis focuses on the role that codeswitching plays in getting the group to collaborate in managing their negotiation.

Excerpt 7. Student Does

S S2
S3 S4

1 S: ((to student at next table)) estoy en la tres
I'm on the third
2 S: I'm [helping] these guys, ((points to S2 and S4))
4 S3: [{R} WHAT]
5 S3: °of°
6 S: que no saben nada,
cuz they don't know anything
7 S3: the Molly's, .. NO WAI:T ((stands up))
8 S2: I'm ([only] even on the third one,) ((hi)) third one, ((S2 looks up at
9 [T standing behind her))
10 (.10)
11 S: [kay?] ((to student at next table))
12 S3: we're wrong in the fourth one too:,
13 ((S3 holds up four fingers))
14 ...
15 S: ((to S3)) [~QUÉ:?
what
16 S2: [that's for YOU:, I copied off YOU:.
17 S3: ALL OF U:S ((makes circle with hand around table))
18 S: what, [yo no*( )*
I didn't
19 S3: [en la cuatro estaba MA:L,
in the fourth it-was bad
20 porque (tú/te) crees qué dijo la maestra
because you believe what the teacher said
21 .hh 'e aquí [.h que DOES es como una pregunta?]
there's here that DOES is like a question
22 T: ((to S4)) [do the fourth one with everybody,]
23 then you can come back *to* this.
24 S: SÍ:, pero [ésta estaba allá,] te acuerdas?
yes but this ((word)) is there remember
25 ((S points to S3's paper,then returns *to his* work))
26 (.20)
27 S3: =MERVIN ESTÁ-=
is
28 S4: ((to T)) ( )
29 ((S4 and S2 laugh))
30 S3: .hh entonces ((taps S's arm)) tiene que ser
so it has to be
31 {R} Mervi::n gives [Molly adV*ICE*.
32 S2: [I wanta ( )
33 S: yeah, Mervin- ((quickly shows his paper to S3 then he erases it))

As the interaction begins, S is boasting to a student at the next *table about how much* work they have done. When the teaching aide comes to his table, S playfully turns to S2 and S4, saying "I'm helping these guys" (i.e., those at the next table). Two turns later he adds "que no saben nada" (who don't know anything). The two remarks are made for everyone to hear. S in effect is setting up a contrast between his use of English to refer to his own activity and his use of Spanish to say that S2 and S4 don't know anything. Meanwhile S's partner, S3, who has been working on the new ques-

tion, begins constructing the answer frame with a loud "WHAT" (in line 4); there is no response. Following S's turn, S3 continues trying to involve the others in the framing task by standing up to attract attention. She ends her turn with an exclamation: "NO WAIT!" But the others keep on with what they're doing. S3 follows up in line 12 with, "we're wrong in the fourth one," holding up four fingers by way of emphasis. This finally produces results as both S (in line 15) and S2 (in line 16) turn to S3 in response. S, who does not know what is going on, comes out with a Spanish "QUÉ," while S2 responds by suggesting that since her answer was copied from S3, the error is not hers. S3 replies that the problem concerns everyone at the table (line 17). S still does not seem to understand the problem and switches to Spanish (line 18), whereupon S3 follows his lead and explains in Spanish her previous remarks. S3 and S continue in Spanish and begin to collaborate on the answer to the English problem. S3's question (line 21) refers to the directions the teacher gave them earlier in the same session. The directions were given in English, but S3 refers to them in Spanish. Following this, S calls attention to the fact that the remaining words in the answer need reordering. S3, who previously had tried several unsuccessful sentence openers (lines 3 and 7), restarts the framing task once more, this time beginning with "Mervin." This enables her to formulate the first part of the answer in such a way that S agrees (lines 31-33).

Our main point here is that the switch to Spanish is meaningful and sets up discursive oppositions or contrasts by its sequential positioning in the exchange. It works in much the same way that prosody works in earlier excerpts. In both cases, meaning is interactively established, because discursive oppositions rely on the sequential organization of turns at speaking. Two interactive issues are involved. The first has to do with managing the interaction. Because the knowledge of Spanish marks the bilingual students as a group apart from their monolingual English-speaking counterparts, speaking Spanish can be seen as one of their strategies for invoking shared background. By extension it can thus be said to encourage collaboration. In this respect, it is interesting that S3 has, from the beginning of the exchange, been trying to get the others to stay on task. She uses a succession of appeals, starting first by prosodically marking and thereby foregrounding her action of framing the answer, then turning to a comment said outloud, then standing up and gesturing with her hands, and finally switching to Spanish. It is this last strategy that produces results. The second issue relates to the choice of Spanish to incorporate what students have learned in English into what they already know. Spanish here creates an interactive space that enables them to discuss freely and creates the climate for inventive exchanges such as the one in the "spell 'little'" sequence.

In the literature on bilingualism, it is generally argued that the function of codeswitching can be described in terms of rules specifying what forms are to be used when, why, and for what circumstances, which have the force of social norms. The underlying assumption is that situations of use can be treated as separate objectifiable entities apart from the actual talk. On the other hand, our argument here is that in conversational practice, codeswitching conveys meaning not by itself but by the way forms are juxtaposed in talk. For instance, in the excerpts above, codeswitching is one of an array of rhetorical devices, along with style switching and voicing, that enter into the management of the collaborative task. Hence seen in interactional terms, bilingual communication should not be singled out as something apart from everyday interaction. In the situations we studied (and in many other situations), bilingual abilities constitute an integral part of the speakers' and listeners' everyday communicative repertoire. Cooperative learning allows students to scaffold their learning on such already developed communicative resources, including their own first language.

CONCLUSION

A paramount concern for researchers examining non-traditional classroom structures is how these curriculum-imposed participation frameworks influence the students' learning (Jacobs, 1992). With respect to cooperative learning curricula, for example, we ask: How do children learn when they are left to rely on peer group processes and discourse? In attempting to deal with this question, we have relied on interactional sociolinguistic approaches to discourse analysis that enable us to deal with monolingual and bilingual communication within the same analytical framework. Rather than focus on choice of style and language as something apart from other communicative practices, we have concentrated on the role that linguistic resources play in setting up the social environments that facilitate learning. This implies a perspective on children's relevant communicative resources that is quite different from the view that underlies most educational curricula. In most work in educational sociolinguistics, the term *linguistic knowledge* is used to refer to grammar and lexicon, whereas style and codeswitching are treated as matters of language usage determined by extra-linguistically-defined rules or norms of appropriateness. Our argument is that code or style switching must be considered to convey essential information, information that in its turn affects our understanding of what is said (Martin-Jones and Heller, 1997). From this point of view, all children in school need to rely on a linguistically diversified repertoire of styles, genres of speaking, and languages or dialects to be able to call on this knowledge to achieve communicative effect and to conduct social interaction.

The difference between monolingual and bilingual children, then, is not what they do with language, but how they do it. In our data, differing communicative resources are brought to bear on the same learning practices. Whereas monolinguals rely on style switching and voicing, bilinguals employ these in addition to their bilingual resources. Furthermore, our analyses enable us to show how, while using their own seemingly casual verbal strategies, students work seriously on the language problems that are appropriate to and elicited by the academic tasks in which they are engaged. These problems, however, are not necessarily the problems proposed or foreseen by the curriculum. Frequently, in the course of their self-directed discussions, students raise and address their own linguistic concerns, in addition to dealing with the learning task as defined by the curriculum. It is important to recognize both what children are discussing and how they are going about solving problems if we want to create learning environments that favor the acquisition of literacy. Language use must be seen as a resource in the creation of such environments.

Understanding the role that language practices play in learning takes on special importance with the shift to alternative classroom organizations such as cooperative instructional formats. But to recognize this point is also to see that understanding how to work with the children's communicative conventions involves more than merely monitoring classroom performance. The more we learn about children's collaborative practices, the more effective we will become in devising appropriate pedagogical strategies and in working out methods of assessment that build on naturally occurring classroom activity.

SUMMARY POINTS

- When students in cooperative learning groups are left to themselves to accomplish learning activities, they tend to rely on communicative practices that are significantly different from adult talk, so that adult observers might have difficulty assessing what the children are accomplishing.

- For example, students shift their communicative style from informal peer group conversational forms to more formal styles of schooled discourse in negotiating solutions to particular tasks.

- Another common communicative practice the children employ is to rely on shifts in intonation or tone of voice, stress, volume, and tempo to convey information that adults tend to convey through words.

- Bilingual students' codeswitching functions in ways that are equivalent to the above strategies and thus constitutes a communicative resource for learning in bilingual cooperative groups.

- An understanding of children's communicative styles is especially important for teachers in cooperative learning programs if they are to be successful in assessing and facilitating group activity.

NOTES

[1] Cooperative Integrated Reading and Composition (CIRC) is a comprehensive program for teaching reading and writing/language arts. It has three principle elements: story-related activities, direct instruction in reading comprehension, and integrated language arts/writing. In CIRC, teachers use anthologies, basal readers, and/or novels, much as they would in traditional reading programs. Students are assigned to teams composed of pairs of students from the same or different reading groups. Students work in pairs on a series of cognitively engaging activities, including reading to each other; predicting how stories will end; summarizing stories to each other; writing responses to stories; and practicing spelling, decoding, and vocabulary. Students work in teams to understand the main idea and master other comprehension skills. During language arts periods, students also write drafts, revise and edit one another's work, and prepare to "publish" their writing.

2 The letters above the transcript give a schematic diagram of students' seating arrangements.

3 For the purposes of this excerpt, we use standard English alphabet to represent what was spoken and italics for translations from Spanish.

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TRANSCRIPTION CONVENTIONS

[ ]	overlapping simultaneous talk
( )	unintelligible speech
(( ))	transcriber's and analyst's comments
:	lengthened pronunciation, the more colons the more lengthened
?	final rising intonation
,	listing intonation (e.g. more is expected)
.	final falling intonation
(.)	micropause
..	pauses of less than .5 second
...	pauses of greater than .5 second
(0.2)	two tenths of a second pause
HI	stressed pronunciation
-	truncation (e.g. what ti- what time is it?)
{R>} {<R}	talk is reading aloud between symbols
{W>} {<W}	talk is voiced writing between symbols
*	accent: normal prominence
**	accent: extra prominence
~	fluctuating intonation preceding the syllable

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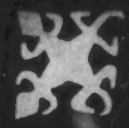

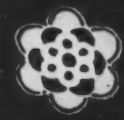

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